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MANAGEMENT REPORT

A PRELIMINARY RESOURCE INVENTORY OF THE
VERTEBRATES AND VASCULAR PLANTS OF
CAPE LOOKOUT NATIONAL SEASHORE
NORTH CAROLINA

MANAGEMENT REPORT NO. 22

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A PRELIMINARY RESOURCE INVENTORY OF THE VERTEBRATES AND VASCULAR PLANTS OF CAPE LOOKOUT NATIONAL SEASHORE NORTH CAROLINA

MANAGEMENT REPORT NO. 22

compiled by
Resource Management and Visitor Protection Staff
Cape Lookout National Seashore
National Park Service
U.S. Department of the Interior

December 1977

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INTRODUCTION

Cape Lookout National Seashore is a new National Park Service area that was established on June 8, 1976. There have been previous biological studies of this area however, there has not been any attempt to consolidate this data. The checklists herein were compiled to record our present state of information for the benefit of park managers, planners and field personnel. It is based primarily on the literature and supplementary information collected by the park staff between December 1976 and December 1977. The latter data is substantiated by specimens, observation cards or photographs on file at Park Headquarters.

This is a preliminary work and should be treated as such; it is intended more to point out gaps in our knowledge than to be the definitive work. It is clear that the data will require annual updating. With this in mind, field personnel should record all new observations on Form 257 (Natural History Field Observation). Photographs or specimens of unusual observations will add substance to the data.

Throughout this report no attempt has been made to include hypothetical species and little effort has been made to discredit questionable records. The scope of this report includes the authorized seashore from Portsmouth Island to Cape Lookout and Shackleford Banks. It does not include the administrative site on Harkers Island.

For consistency, we used geographic breakdowns for recording information as follows:

(1) Shackleford Banks

(2) Core Banks south of New Drum Inlet

(3) Core Banks between New Drum Inlet and Swash Inlet

(4) Portsmouth Island (above Swash Inlet)

The only deviation from this procedure was with the birds, when it was felt more useful to develop the data on a seasonal basis without regard to the above geographic separations. The seasons are broken down by month as follows:

Spring - March to May

Summer - June to August

Fall - September to November

Winter - December to February

On all check lists, the following code was used to cite the authority for the record:

X = recorded in the literature (see references)

S = voucher specimen in major institution or park collection

H = voucher specimen in park herbarium

O = field observation recorded in park files

N = nesting (birds only)

In some cases more than one source (literature and voucher specimen) are jointly recorded. Field observation data is used only when a higher source level was not available.

At this time, specimens from the Seashore are known to be housed in the following institutions. The institution, species and catalog numbers are on file at park headquarters.

Washington Missionary College - reptiles and amphibians

University of Illinois Museum of Natural History - reptiles and amphibians

North Carolina State Museum - reptiles and amphibians

Duke University - reptiles and amphibians

Museum of Comparative Zoology, Harvard - reptiles and amphibians

California State University at Long Beach - reptiles and amphibians

University of Kansas - reptiles and amphibians

Chicago Field Museum - reptiles and amphibians

University of Massachusetts at Amherst - mammals

We would like to acknowledge the assistance of the following persons who provided information or assisted in identifications:

John O. Fussell III (bird records)

Melinda Godfrey (plant collections)

Les and Sally Moore (bird records)

William Palmer (reptile and amphibian records)

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Jeannie Wilson (plant records)

Maury Wolff (fish identifications)

This report was prepared under the general direction and editorship of Chief Park Ranger, Norman Reigle. The following staff members were primarily responsible for data collection and chapter preparation as follows:

Plants - James S. Holland with Daphne A. Hatch

Fish, Amphibians and Reptiles - Norman J. Reigle

Birds - William F. Prange and Keith P. Voges

Mammals - Numi C. Spitzer

VASCULAR PLANTS

Three areas of the Outer Banks of North Carolina have been examined periodically by botanists and serve to illustrate the recent changes in vegetation. T. H. Kearney first developed a plant checklist for Ocracoke in 1898. Similar studies have been completed more recently by Rondthaler in 1951 and Burke in 1961.

Two areas of Cape Lookout National Seashore have been repeatedly studied botanically. Shackleford Banks at the south has been examined twice over the past 50 years, first by I. F. Lewis in 1917 and later by Shu-Fun Au between 1966 and 1968. Portsmouth Village to the north was first studied by C. John Burk in 1959 and later followed up by Burk and Lavermann in 1973. This is the only area where the same individual worked in different time periods. In their paper Burk and Lavermann discuss some of the environmental factors affecting the development of the flora and make comparisons between the vegetation of Portsmouth, Ocracoke and Shackleford.

The most comprehensive analysis of barrier island ecology was by Godfrey and Godfrey in 1976. Their study began in 1968 and includes many factors which influence the ecosystem. Their work was conducted primarily at Cape Lookout National Seashore and addresses vegetation, rather than floristics.

There are many controversial issues relating to barrier island ecology. The most outstanding being the construction of artifical dunes. This manipulation has no doubt effected the distribution and composition of the flora. Artificial dune construction has taken place at Ocracoke but not at Cape Lookout National Seashore, except a small sand fence between Drum Inlet and Portsmouth. Another significant factor is man's introduction of cultivated

plants and grazing animals. The latter factor is probably the most serious threat to the natural vegetation.

Although man's presence has affected the natural vegetation, the harsh physical environment including high temperatures, wind, salt spray and coarse soils creates an environment in which few plants can survive. However, it is currently the lack of these environmental factors which is most apparent. The last major hurricane occurred in 1959 and without this major disturbance plants, which would have otherwise been eliminated, have become well established. Thus, without recent oceanic overwash, the current vegetation may only be temporary.

The previous studies do illustrate some trends in barrier island vegetation. In 1898, Kearney identified 130 species in his pioneer study at Ocracoke, while Rondthaler in 1959, collected only 101 species from this area, of which 50 were cited by Kearney but increased the total flora to 158 species. Two factors may be responsible for the increasing diversity at Ocracoke, overgrazing and the introduction of species which were not native to the area. On Shackleford, Au found 281 taxa, of which 171 were listed by Lewis in 1917. Lewis found a total of 239 taxa, indicating 68 extinctions and 102 invasions over the half century. Although Shackleford was essentially uninhabited during this period, it was extensively grazed.

Burke and Lavermann found 45 additional species on Portsmouth between 1959 and 1973. Most livestock had been removed prior to 1959; however, grazing could still be indicated as a major factor in the increasing floral diversity. The expansion in species diversity was analyzed by Burk and Lavermann for both Ocracoke and Portsmouth. Consistent with other studies in coastal environments, they recognized a growth phase following the

elimination of grazing. Shackleford is continuing to support grazing and is also increasing in species diversity; however, at an apparently slower rate.

In addition to removal of grazing and an increase in the number of human visitors, application of the theory of island biogeography may help to explain some of the changes on Ocracoke, Portsmouth and Shackleford. The vegetative diversity of oceanic islands has been viewed as a balance between invasions and extinctions of species. Some species decline however, following a severe hurricane invasions increase during early successional stages. Thus, in areas with varied topography there is often an initial drop followed by an increase in species. Shackleford Banks basically exhibits an equilibrium, while Ocracoke and Portsmouth Islands are in growth phases.

There are a number of plants which have been recognized as exotic within the park. Burk and Lavermann (1973) cite species which have survived from former cultivation in Portsmouth. These plants do not occur "natively" on the banks or the adjacent mainland. These include Gladiolus x gandavensis, Cara x generalis, Daubentonia punice, Ipomoea batatus and Oxalis rubra. Others found south of Portsmouth are Populus alba and Nigra, Lilium catesbaei and one species of Verbena. The latter species are restricted to the populated area just north of the Cape Lookout Coast Guard Station.

In compliance with the Endangered Species Act of 1973, the flora of Cape Lookout National Seashore has been analyzed. The most recent listing by the Smithsonian was available for this study. There are no citations which are consistent between the Smithsonian list and that constructed for the National Seashore.

The checklist was derived primarily from the literature pertaining to the ecology of the Outer Banks. Shu-Fun Au in his "Vegetation and Ecological Processes on Shackleford Banks, North Carolina," constructed a list of the vascular plants which served as the foundation for a park-wide listing. To supplement Au's work, three additional publications were cited expanding the distribution of many species to Core Banks (Godfrey and Godfrey 1976) and Portsmouth Island (Burke 1966 and Burk & Lavermann 1973).

Currently the list contains 319 taxa, representing 83 families of vascular plants. Of the 319 listings, 311 are angiosperms, 2 gymnosperms and 6 are vascular cryptogams. Those species regarded as exotic have not been included in this listing.

It is interesting to note that Shackleford Banks exhibits a much greater diversity than any of the other Cape Lookout National Seashore islands. Shackleford shows a total of 276 species, while Core Banks south of Drum Inlet has 188, Core Banks north of Drum Inlet has 54 and Portsmouth Island has 111. One factor, in particular, explains the vegetative richness on Shackleford, the prevailing winds in this area are from the southwest in the summer and northeast in the winter. The length of Shackleford's outer beach faces directly southwest. New sand is therefore blown onto the island and back into the dunes, creating in places a line of dunes 25 to 40 feet high. This dune line has built up during a period of relatively quiet weather. It thus provides the protection needed for survival of a maritime forest behind the dune line. Most of the species found on Shackleford and not on Core Banks would be expected to be associated with this 85-acre forest.

Core Banks and Portsmouth Island run in a northeast direction, the outer beach facing southeast, so the wind moves the sand along the island

instead of bringing new sand in. The sand dunes on Core Banks are open and generally less than 6 feet high, so they provide little protection from salt spray, wind and overwash, preventing further development of the vegetation. Also, note that Godfrey and Godfrey did not compile a checklist of plants for Core Banks, since they were addressing vegetation and ecology, not floristics, so it would be expected that a few more species could be added to the Core Banks checklist.

The low number of species north of Drum Inlet is easily explained by lack of study. The listings were obtained by brief field trips. It would be expected to be very similar in composition to Core Banks south of Drum Inlet.

Portsmouth Island lies between Pamlico Sound and the Atlantic Ocean, and has very wide expanses of tidal flats. The lower diversity here would be explained by the increased exposure to the elements from both sides of the island. Interestingly, Portsmouth has no live oaks on it, unlike the other islands in the park.

SPECIES AND COMMON NAME	Shackleford Banks	Core Banks South of Drum Inlet	Core Banks North of Drum Inlet	Portsmout Island
PTERIDOPHYTA				
Osmundaceae				
Osmunda regalis L. var. *spectabilis* (Willd.) Gray Royal fern	X	H		X
Pteridaceae				
Pteridium aquilinum (L.) Kuhn Bracken fern	X			
Aspidiaceae				
Thelypteris palustris Schott Marsh fern	X			
Blechnaceae				
Woodwardia virginica (L.) Smith Virginia chain fern	X			
Aspleniaceae				
Asplenium platyneuron (L.) Oakes Ebony speenwort	X	H		O
Polypodiaceae				
Polypodium polypodioides (L.) Watt Resurrection fern	X	X		
GYMNOSPERMAE				
Pinaceae				
Pinus taeda L. Loblloly pine	X	X	O	X
Cupressaceae				
Juniperus virginiana L. Red cedar	X	X H	O	X
ANGIOSPERMAE MONOCOTYLEDONS				
Typhaceae				
Typha angustifolia L. Narrow leaf cattail		X		
Typha latifolia L. Common cattail	X	X		X
Zosteraceae				
Zostera marina L. Eel-grass	X	O		

SPECIES AND COMMON NAME	Shackleford Banks	Core Banks South of Drum Inlet	Core Banks North of Drum Inlet	Portsmout Island
Juncaginaceae				
Triglochin striata R. & P. Arrow grass	X			
Alismataceae				
Sagittaria falcata Pursh Arrow-head	X			
Sagittaria latifolia Willd. Duck potato	X	X		
Poaceae				
Agrostis stolonifera L. Red-top				X
Ammophila brevigulata Fernald American beach grass		X		
Andropogon scoparius Michx. Dune bluestem	X	O		
Andropogon virginicus L. Broom sedge	X	X H		X
Cenchrus longispinus (Hackel) Fernald Sand spur				X
Cenchrus tribuloides L. Sand spur	X	X H		O
Chloris petraea Swartz Finger grass	X	X		
Cynodon dactylon (L.) Pers. Bermuda grass	X	X		
Digitaria filiformis (L.) Koel. Crab grass	X	H		
Digitaria sanguinalis (L.) Scop. Crab grass	X		O	X
Distichlis spicata (L.) Greene Salt grass	X	X H		X
Echinochloa crusgalli (L.) Beauv. Barnyard grass	X			
Echinochloa walteri (Pursh) Heller Walter's barnyard grass	X			
Elymus virginicus L. Wild rye grass	X	H		X
Eragrostis elliottii S. Wats. Love grass	X	H		
Eragrostis pilosa (L.) Beauv. Love grass		X		
Eragrostis refractus (Muhl.) Scribner				X
Eragrostis spectabilis (Pursh)Steudel Tumble grass		H		X

SPECIES AND COMMON NAME	Shackleford Banks	Core Banks South of Drum Inlet	Core Banks North of Drum Inlet	Portsmout Island
Festuca myuros L. Fescue	X			
Festuca octoflora Walt. Fescue	X			
Festuca rubra L. Fescue	X	H		
Melica mutica Walt. Melic grass	X			
Muhlenbergia capillaris (Lam.) Trin. Purple muhly	X	X H	O	X
Oplismenus setarius (Lam.) R. & S.	X			
Panicum amarum Ell. Panic grass		H		
Panicum anceps Michx. Beaked panic grass	X			
Panicum anceps Michx. var. *rhizomatum* (Mitch&Chase)Fern Panic grass	X	H		
Panicum commutatum Schult. Panic grass	X			
Panicum lancearium Trin. Panic grass	X			
Panicum sphaerocarpon Ell. Panic grass	X			
Panicum spretum Schult. Panic grass	X			
Panicum virgatum L. Switch grass	X	H		
Panicum virgatum L. var. *cubense* Griseb. Panic grass	X			
Paspalum distichum L. Knot grass	X	O		X
Paspalum floridanum Michx. Paspalum	X	X		
Paspalum laeve Michx. Paspalum	X	O		X
Paspalum setaceum Michx. Paspalum	X			
Paspalum vaginatum Swartz Smooth knotgrass	X	H		
Phalaris caroliniana Walt. Canary grass	X			
Poa annua L. Blue grass	X			

SPECIES AND COMMON NAME	Shackleford Banks	Core Banks South of Drum Inlet	Core Banks North of Drum Inlet	Portsmout Island
Poa pratensis L. Kentucky blue grass	X			
Polypogon monspeliensis (L.) Desf. Rabbit foot grass	X	O	O	
Sacciolepis striata (L.) Wash	X	O		
Setaria geniculata (Lam.) Beauv. Foxtail grass	X	X H		X
Setaria glauca (L.) Beauv. Foxtail grass	X			
Setaria magna Griseb. Giant foxtail grass	X	O		X
Sorghastrum elliotii (Mohr) Nash Indian grass	X			
Spartina alterniflora Loisel. Salt marsh cordgrass	X	X H	O	X
Spartina cynosuroides (L.) Roth Salt reed grass		X H		
Spartina patens (Ait.) Muhl. Salt meadow cordgrass	X	X H	O	X
Sphenopholis obtusata (Michx.)Scribn. Wedge grass	X			X
Sporobolus poiretii (R. & S.) Hitch. Smut grass	X			
Stipa avenacea L. Needle grass	X	X		
Tridens flavus (L.) Hitch. Purple-top	X			
Triplasis purpurea (Walt.) Chapm. Purple sand grass	X	X		X
Trisetum pensylvanicum (L.) Beauv. Swamp oats	X			
Uniola laxa L. BSP. Spike grass	X	X		
Uniola paniculata L. Sea oats	X	X	O	X
Cyperaceae				
Bulbostylis capillaris (L.) Clarke		O		
Bulbostylis stenophylla (Ell.)Clarke	X	X		
Carex alata Torrey Sedge	X			
Carex nigromarginata Schwein. var. *floridana* (Schwein.)Kukenth. Sedge	X			

SPECIES AND COMMON NAME	Shackleford Banks	Core Banks South of Drum Inlet	Core Banks North of Drum Inlet	Portsmout Island
Cladium jamaicense Crantz Saw grass	X	X H		
Cyperus filicinus Vahl Cyperus	X	O		
Cyperus flavescens L. Cyperus	X			
Cyperus globulosus Aubl. Cyperus	X			
Cyperus haspan L. Cyperus	X			
Cyperus odoratus L. Cyperus	X			X
Cyperus polystachyos Rottb var. *texensis* (Torr.) Fern. Cyperus	X			X
Cyperus retrorsus Chapm. Cyperus	X	O		X
Cyperus rivularis Kunth Cyperus		O		
Cyperus strigosus L. Cyperus	X	O		X
Dichromena colorata (L.) Hitch. Whitetop sedge	X	X	O	O
Eleocharis albida Torr. Spike rush	X			X
Eleocharis fallax Weath. Spike rush	X			
Eleocharis flavescens (Poir.) Urban Spike rush	X			
Fimbristylis autumnalis (L.) R. & S.				X
Fimbristylis spadicea (L.) Vahl	X	X H		X
Fuirena breviseta Coville Umbrella grass	X			
Fuirena squarrosa Michx. Umbrella grass	X			
Rhynchospora odorata Griseb. Beak-rush	X			
Scirpus americanus Pers. Three square		X		X
Scirpus robustus Pursh Bullrush		H		
Scleria triglomerata Michx. Nut rush		H		

SPECIES AND COMMON NAME	Shackleford Banks	Core Banks South of Drum Inlet	Core Banks North of Drum Inlet	Portsmouth Island
Arecaceae				
Sabal minor (Jacq.) Pers. Palmetto	X	X		
Araceae				
Acorus calamus L. Sweet flag	X			
Bromeliaceae				
Tillandsia usneoides L. Spanish moss	X	X		
Commelinaceae				
Commelina erecta L. Day flower	X	X	O	X
Juncaceae				
Juncus biflorus Ell. Rush	X			X
Juncus coriaceus Mackenz. Rush	X	X		
Juncus dichotomus Ell. Rush	X			X
Juncus effusus L. Rush		O		
Juncus megacephalus M. A. Curtis Rush	X	X		
Juncus roemerianus Scheele Black needle rush	X	X	O	X
Juncus scirpoides Lam. Rush		O		X
Juncus tenuis Willd. Path rush	X			
Liliaceae				
Allium bivalve (L.) Kuntze False-garlic	X			X
Smilax auriculata Walt. Catbrier	X	H		
Smilax bona-nox L. China brier	X	H	O	X
Smilax glauca Walt. Glaucous brier	X	O		
Smilax laurifolia L. "Bamboo"	X	O		
Yucca gloriosa L. Spanish dagger	X			

SPECIES AND COMMON NAME	Shackleford Banks	Core Banks South of Drum Inlet	Core Banks North of Drum Inlet	Portsmout Island
Iridaceae				
Sisyrinchium mucronatum Michx. var. *atlanticum* (Bickn.) Ahles Blue-eyed-grass	X	H	O	
Orchidaceae				
Corallorhiza wisteriana Conrad Coral root	X			
Spiranthes vernalis Engelm. & Gray Spring ladies' tresses	X	X	O	O
DICOTYLEDONS				
Salicaceae				
Populus alba L. White poplar	X	X H	O	X
Salix caroliniana Michx. Swamp willow	X			
Myricaceae				
Myrica cerifera L. Wax myrtle	X	X H	O	X
Betulaceae				
Carpinus caroliniana Walt. Ironwood	X	X		
Fagaceae				
Quercus laurifolia Michx. Laurel oak		X		
Quercus phellos L. Willow oak	X	X		
Quercus virginiana Mill. Live oak	X	X		
Moraceae				
Ficus carica L. Fig		O		X
Maclura pomifera (Raf.) Schneid. Osage-orange	X			
Morus rubra L. Red mulberry	X	X		
Urticaceae				
Boehmeria cylindrica (L.) Swartz Bog hemp	X	X		
Parietaria floridana Nuttall	X			

SPECIES AND COMMON NAME	Shackleford Banks	Core Banks South of Drum Inlet	Core Banks North of Drum Inlet	Portsmouth Island
Pilea pumila (L.) Gray Clearweed	X			
Loranthaceae				
Phoradendron serotinum (Raf.) Johns. Mistletoe	X	X		
Polygonaceae				
Polygonum glaucum Nuttall Seabeach knotweed	X	X H	O	
Polygonum lapathifolium L. Smartweed	X			
Polygonum punctatum Ell. Water smartweed	X	H		X
Rumex crispus L. Yellow dock				X
Rumex hastatulus Baldwin Sorrel				X
Chenopodiaceae				
Atriplex arenaria Nuttall Seabeach orach	X	H		
Atriplex patula L. Orach	X	H		X
Chenopodium ambrosioides L. Mexican tea	X			X
Salicornia bigelovii Torrey Dwarf glasswort	X	H	O	X
Salicornia europea L. "Samphire"		H		X
Salicornia virginica L. Perennial glasswort	X	H		X
Salsola kali L. Russian thistle	X	X H		
Suaeda linearis (Ell.) Moq. Sea blite		H		
Amaranthaceae				
Amaranthus hybridus L. Pigweed		H		
Amaranthus pumilus Raf. Seabeach amaranth	X	X H		
Iresine rhizomatosa Standley Blood leaf	X			
Aizoaceae				
Mollugo verticillata L. Carpetweed	X			

SPECIES AND COMMON NAME	Shackleford Banks	Core Banks South of Drum Inlet	Core Banks North of Drum Inlet	Portsmout Island
Sesuvium maritimum (Walt.) BSP. Sea purslane		H	O	
Sesuvium portulacastrum L. Sea purslane		H		
Phytolaccaceae				
Phytolacca americana L. Pokeweed	X	H	O	X
Caryophyllaceae				
Arenaria lanuginosa (Michx.) Rohrb. Sandwort	X			
Arenaria serpyllifolia L. Sandwort	X			
Cerastium glomeratum Thuillier Mouse-ear chickweed	X			
Paronychia riparia Chapman	X			
Silene antirrhina L. Sleepy catch-fly	X			
Stellaria media (L.) Cyrillo Chickweed	X		O	
Ceratophyllaceae				
Ceratophyllum demersum L. Hornwort	X			
Ranunculaceae				
Clematis ligusticifolia Nuttall Virgins bower	X			
Ranunculus sceleratus L. Buttercup	X			
Magnoliaceae				
Magnolia virginiana L. Sweet bay	X			
Lauraceae				
Persea borbonia (L.) Sprengel Red bay	X H	X		
Sassafras albidum (Nuttall) Nees Sassafras		O		
Brassicaceae				
Cakile edentula (Bigel.) Hooker Sea rocket	X	X	O	X
Cardamine hirsuta L. Bitter cress	X			
Lepidium virginicum L. Poor-man's pepper grass	X	X H		X

SPECIES AND COMMON NAME	Shackleford Banks	Core Banks South of Drum Inlet	Core Banks North of Drum Inlet	Portsmouth Island
Rosaceae				
Prunus caroliniana (Mill.) Aiton Laurel cherry	X			
Prunus serotina Ehrhart Black cherry		H		
Rosa palustris Marshall Swamp rose		H		
Rubus trivialis Michx. Dewberry	X	O		
Fabaceae				
Cassia nictitans L. Wild sensitive plant		O		
Desmodium paniculatum (L.) DC. Beggar's ticks	X	O		X
Desmodium perplexum Schubert Beggar's ticks	X			
Galactia macreei M. S. Curtis Milk-pea	X			
Strophostyles helvola (L.) Ell. Wild bean	X	X H		X
Strophostyles umbellata (Muhl.)Britt. Wild bean	X	H		
Trifolium dubium Sibthorp Low hop clover	X		O	
Linaceae				
Linum virginianum L. var. *medium* Planchon Flax	X	H		
Oxalidaceae				
Oxalis europaea Jordan Wood sorrel	X		O	
Geraniaceae				
Geranium carolinianum L. Cranesbill	X			
Rutaceae				
Zanthoxylum clava-herculis L. Hercules'-club	X	X H	O	X
Euphorbiaceae				
Acalypha gracilens Gray Three-seeded mercury	X	O		X
Cnidoscolus stimulosus (Michx.) Engelm. & Gray Spurge nettle	X	X		

SPECIES AND COMMON NAME	Shackleford Banks	Core Banks South of Drum Inlet	Core Banks North of Drum Inlet	Portsmouth Island
Croton glandulosus L. Croton	X			
Croton punctatus Jacquin Silver leaf croton	X	X	O	X
Euphorbia maculata L. Spurge	X			
Euphorbia polygonifolia L. Beach spurge	X	X	O	X
Euphorbia supina Raf. Milk purslane				X
Anacardiaceae				
Rhus copallina L. Winged sumac	X	X		
Rhus radicans L. Poison ivy	X	X		O
Aquifoliaceae				
Ilex glabra (L.) Gray Inkberry	X			
Ilex opaca Aiton American holly	X	X		
Ilex vomitoria Aiton Yaupon	X	X	O	X
Rhamnaceae				
Berchemia scandens (Hill) K. Koch Rattan vine	X	X		
Vitaceae				
Ampelopsis arborea (L.) Koehne Pepper vine	X H	X H		
Parthenocissus quinquefolia(L.)Planch. Virginia creeper	X	X H	O	X
Vitis aestivalis Michx. Summer grape	X			
Vitis labrusca L. Fox grape	X			
Vitis rotundifolia Michx. Muscadine grape	X	X H		
Malvaceae				
Kosteletzkya virginica (L.) Presl. Seashore mallow	X	X H	O	X
Hypericaceae				
Hypericum gentianoides (L.) BSP. Pineweed	X	O		X
Hypericum hypericoides (L.) Grantz St. Andrew's cross	X	O		

SPECIES AND COMMON NAME	Shackleford Banks	Core Banks South of Drum Inlet	Core Banks North of Drum Inlet	Portsmout Island
Hypericum mutilum L. St. Johns-wort	X			
Cistaceae				
Helianthemum corymbosum Michx. Frostweed	X	H		
Helianthemum georgianum Chapman Frostweed	X	H		
Lechea legettii Britton & Hollick Pinweed		O		
Lechea villosa Ell. Pinweed	X	O		
Violaceae				
Viola primulifolia L. Violet	X			
Passifloraceae				
Passiflora lutea L. Yellow passion-flower	X	H		
Cactaceae				
Opuntia drummondii Graham Fragile prickly pear	X	O		X
Opuntia humifusa Raf. Prickly pear	X	O		
Lythraceae				
Ammannia teres Raf.	X			
Cuphea carthagensis (Jacq.) Macbr. Waxweed	X	H		
Lythrum lineare L. Linear-leaved loosestrife	X	X H		
Onagraceae				
Gaura angustifolia Michx.	X	X	O	X
Gaura parviflora Douglas		H		
Ludwigia alata Ell. False loosestrife	X			
Ludwigia maritima Harper	X			
Ludwigia microcarpa Michx. False loosestrife	X	H		
Ludwigia palustris (L.) Ell. Water purslane	X			
Oenothera fruticosa L. Sundrops		X H	O	

SPECIES AND COMMON NAME	Shackleford Banks	Core Banks South of Drum Inlet	Core Banks North of Drum Inlet	Portsmout Island
Oenothera humifusa Nuttall Seabeach evening primrose	X	X H	O	X
Apiaceae				
Centella asiatica (L.) Urban Pennywort	X	X H		O
Cicuta maculata L. Water hemlock	X	X	O	
Hydrocotyle bonariensis Lam. Seaside pennywort	X	X H	O	O
Hydrocotyle umbellata L. Marsh pennywort	X	X		
Ptilimnium capillaceum (Michx.) Raf. Mock bishops-weed	X	H		X
Sanicula canadensis L. Black snakeroot	X			
Nyssaceae				
Nyssa sylvatica Marshall Black gum	X			
Cornaceae				
Cornus florida L. Flowering dogwood	X	X		
Cornus stricta Lam. Swamp dogwood	X			
Ericaceae				
Vaccinium atrococcum (Gray) Heller Black highbush blueberry	X			O
Primulaceae				
Samolus parviflorus Raf. Water pimpernel	X	X H		
Plumbaginaceae				
Limonium carolinianum (Walt.) Britt. Sea lavender	X	X H		X
Sapotaceae				
Bumelia lycioides (L.) Persoon Chittumwood	X	H		X
Ebenaceae				
Diospyros virginiana L. Persimmon	X	X		
Oleaceae				
Osmanthus americanus (L.) Gray Wild olive	X	X		

SPECIES AND COMMON NAME	Shackleford Banks	Core Banks South of Drum Inlet	Core Banks North of Drum Inlet	Portsmout Island
Loganiaceae				
Cynoctonum mitreola (L.) Britton Miterwort	X			
Gelsemium sempervirens (L.) Aiton Yellow jassamine	X	X		
Polypremum procumbens L.	X	H		X
Gentianaceae				
Sabatia stellaris Pursh Sea pink	X	X	O	X
Asclepiadaceae				
Asclepias lanceolata Walt. Marsh milkweed	X	H		
Cynanchum palustre (Pursh) Heller	X	X H	O	X
Matelea suberosa (L.) Shinners Angle-pod	X			
Convolvulaceae				
Calystegia sepium (L.) R. Brown Hedge bindweed	X			
Cuscuta gronovii Willd. Dodder	X			
Ipomoea pandurata (L.) G.F.W. Meyer Man-root		H		
Ipomoea sagittata Cav. Morning glory	X	X H	O	X
Verbenaceae				
Callicarpa americana L. Beauty berry	X	X H		
Lippia nodiflora (L.) Michx. Frogbit	X	X H		X
Verbena scabra Vahl Vervain	X			
Lamiaceae				
Lycopus virginicus L. Water horehound	X			
Monarda punctata L. Horsemint	X			
Teucrium canadense L. Wood sage	X			
Trichostema dichotomum L. Blue curls	X H			

SPECIES AND COMMON NAME	Shackleford Banks	Core Banks South of Drum Inlet	Core Banks North of Drum Inlet	Portsmouth Island
Solanaceae				
Physalis viscosa L. ssp. *maritima* (M.A.Curtis)Waterfall Ground cherry	X	X H	O	O
Solanum carolinense L. Horse nettle	X		O	X
Solanum gracile Link Nightshade	X			
Scrophulariaceae				
Agalinis maritima (Raf.) Raf. Gerardia	X	H		
Aureolaria laevigata (Raf.) Raf. False foxglove	X			
Bacopa monnieri (L.) Pennell Water hyssop	X	X		X
Linaria canadensis (L.) Dumont Blue toad-flax	X	H		
Verbascum thapsus L. Woolly mullein	X			
Veronica arvensis L. Corn speedwell	X			
Plantaginaceae				
Plantago virginica L. Dwarf plantain	X		O	
Rubiaceae				
Diodia teres Walt. Poorjoe	X	H		X
Diodia virginiana L. Buttonweed	X	H		X
Galium hispidulum Michx. Bedstraw		H		
Galium obtusum Bigelow Bedstraw	X			
Galium pilosum Aiton Bedstraw	X			
Mitchella repens L. Partridge berry	X	X	O	O
Caprifoliaceae				
Lonicera japonica Thunb. Japanese-honey suckle	X			X
Valerianaceae				
Valerianella radiata (L.) Dufr. Corn salad	X			

SPECIES AND COMMON NAME	Shackleford Banks	Core Banks South of Drum Inlet	Core Banks North of Drum Inlet	Portsmout Island
Cucurbitaceae				
Melothria pendula L. Creeping cucumber	X			
Campanulaceae				
Specularia perfoliata (L.) A. DC. Venus looking glass	X	H	O	O
Asteraceae				
Achillea millefolium L. Milfoil	X			
Aster racemosus Ell. Aster				X
Aster subulatus Michx. Aster	X			X
Aster tenuifolius L. Aster		H		X
Aster vimineus Lam. Aster	X			
Ambrosia artemisiifolia L. Ragweed	X	O	O	X
Baccharis halimifolia L. Silverling, groundsel-tree, sea-myrtle	X	X H	O	X
Bidens bipinnata L. Spanish needles	X	X		
Bidens laevis (L.) BSP. Beggar's ticks	X			
Borrichia frutescens (L.) DC. Sea ox-eye	X	H	O	X
Chrysopsis graminifolia (Michx.) Ell. Golden star	X			
Carduus spinosissimus Walt. Yellow thistle	X	O	O	O
Elephantopus nudatus Gray Elephant's foot	X	X		
Elephantopus tomentosus L. Elephant's foot	X			
Erechtites hieracifolia (L.) Raf. Fireweed	X			X
Erigeron canadensis L. var. *canadensis* Horseweed	X	X	O	O
Erigeron canadensis L. var. *pusillus* (Nuttall) Ahles Horseweed		X H		X
Erigeron quercifolius Lam. Oak-leaved fleabane	X		O	X

SPECIES AND COMMON NAME	Shackleford Banks	Core Banks South of Drum Inlet	Core Banks North of Drum Inlet	Portsmo Islan
Eupatorium capillifolium (Lam.) Small Dog fennell	X	O		X
Eupatorium dubium Willd. Joe-pye weed	X			
Eupatorium leucolepis (DC.) T. & G. Thoroughwort		O		
Eupatorium pilosum Walter Thoroughwort		O		
Eupatorium recurvans Small Thoroughwort		O		
Gaillardia pulchella Foug. Blanket flower	X	X H	O	X
Gnaphalium obtusifolium L. Rabbit tobacco	X			X
Gnaphalium purpureum L. Indian tobacco	X	H		
Gnaphalium purpureum L. var. *spathulatum* (Lam.) Ahles Indian tobacco	X			
Heterotheca subaxillaris (Lam.) Britt. & Rusby Camphor weed	X	X		
Hieracium gronovii L. Hawkweed	X	O	O	O
Iva frutescens L. Shrubby marsh elder	X	X H		X
Iva imbricata Walt. Seashore elder	X	X H		X
Krigia virginica (L.) Willd. Dwarf dandelion	X			
Lactuca canadensis L. Wild lettuce	X	X H	O	X
Lactuca graminifolia Michx. Button snakeweed	X	H	O	
Mikania scandens (L.) Willd. Climbing hempweed	X	X		X
Pluchea foetida (L.) DC. Stinking fleabane	X			
Pluchea purpurascens (Sw.) DC. Marsh fleabane	X	H		X
Pluchea rosea Godfrey Marsh fleabane	X	H		
Solidago micrecephala (Greene)Bush Goldenrod		O		X
Solidago sempervirens L. Goldenrod	X	X	O	X

SPECIES AND COMMON NAME	Shackleford Banks	Core Banks South of Drum Inlet	Core Banks North of Drum Inlet	Portsmou Island
Sonchus _asper_ (L.) Hill Spring-leaved sow thistle	X			
Xanthium _strumarium_ L. Cocklebur	X			

FISH

No attempt was made to collect or list the marine or salt marsh species for this report. A good check list of the local marine fauna has been prepared by Ross (1977), and Wolff (1976) conducted an extensive basic fishery resources inventory of the Outer Banks which defined critical nursery areas for economically important fishes. Therefore, this report deals only with the isolated freshwater ponds at Portsmouth, the artificial ponds at the Core Banks Gun Club and Mullet Pond on Shackleford.

Mullet Pond was previously connected by a stream to Back Sound which allowed fish access to the pond. Since this stream has been closed, the fauna of Mullet Pond has dropped to four species and may, in time, decline further. (Schwartz 1970)

Collections at Portsmouth and the Core Banks Gun Club were made with a short seine during the fall of 1977 by park staff and are in the park collection.

SPECIES AND COMMON NAME	Mullet Pond	Gun Club	Portsmouth
Cyprinodontidae			
Cyprinodon variegatus Sheepshead minnow	X	S	S
Fundulus confluentus Marsh killifish	X		
Fundulus heteroclitus Mummichoo		S	S
Fundulus majalis Striped killifish		S	
Lucania parva Rainwater killifish	X	S	S
Poeciliidae			
Gambusia affinis Mosquitofish	X	S	S
Antherinidae			
Menidia beryllina Tidewater silverside		S	S

REPTILES AND AMPHIBIANS

Reptiles and amphibians have been studied to a greater extent than other vertebrate groups at Cape Lookout National Seashore. However, there is still a great deal to be determined about the distribution, abundance and species composition of the fauna. Of great importance to park managers and the park visitor is the status of venomous snakes within the seashore. Two poisonous species are included on the check list, but their current presence within the seashore is doubtful. The one record for the Eastern cottonmouth is based on a visual observation of a single individual by Dr. J. Bailey at Mullet Pond on Shackleford in 1948 (Engles 1952). The Carolina pygmy rattlesnake was reported as "quite common" on Shackleford by Coues and Yarrow in 1878; however, there are no modern records of this species. In addition to the two species above, three other poisonous snakes are found nearby on the mainland of Carteret County. They are the Copperhead (*Agkistrodon contortrix*), Eastern Diamonback rattlesnake (*Crotalus adamanteus*) and Canebrake rattlesnake (*Crotalus horridus atricaudatus*). As of this time, there are no current verified records of poisonous snakes within the seashore.

Records of several species included on the check list are rare enough to deserve special mention and additional work is certainly necessary to determine the true status of these species. The Leatherback turtle is a rarity in North Carolina; however, there is one large uncataloged mounted specimen from Cape Lookout in the North Carolina State Museum and one record of an accidental nesting at Cape Lookout in June 1966 (Schwartz 1976).

There are seven other species known only from a single individual. They are:

Eastern spadefoot - Shackleford - North Carolina State Museum

Spotted turtle - Shackleford - North Carolina State Museum

Ground skink - Shackleford - Duke University

Ribbon snake - Shackleford (Engles 1952 - sight record)

Greenish rat snake - Shackleford - Museum of Comparative Zoology

Eastern hognose - Shackleford - North Carolina State Museum

Northern brown snake - Core Banks - Cape Lookout Files

The Greenish rat snake (*Elaphe obsoleta "parallela"*) was collected on Shackleford by Engles in 1940. It was described by Barbour & Engles as a new subspecies. This individual is the type of *"parallela"* and is now in the Harvard Museum of Comparative Zoology (MCZ 46468). The Greenish rat snake is now considered an intergrade between (*E. o. obsoleta* and *E. o. quadrivittata*).

The Northern brown snake was found by park personnel during a wild fire on Core Banks on October 11, 1977. The snake was about eight inches long and was found under a board three-fourths of a mile south of New Drum Inlet. It was collected, photographed and released.

Two snakes, worth special mention and protection, are the Outer Banks kingsnake (*Lampropeltis getulus sticticeps*) and Carolina salt marsh snake (*Natrix sipedon williamengelsi*). Both are unique to coastal North Carolina. The status of these two are summarized respectively by Lazell and Musick (1973) and Conant and Lazell (1973).

SPECIES AND COMMON NAME	Shackleford Banks	Core Banks South of Drum Inlet	Core Banks North of Drum Inlet	Portsmou Islan
AMPHIBIA ANURA				
Pelobatidae				
Scaphiopus holbrooki Eastern spadefoot	X S			
Bufonidae				
Bufo woodhousei fowleri Fowler's toad	X S	X S		
Hylidae				
Hyla squirella Squirrel treefrog	X S	X S	X	X S
Hyla cinerea Green treefrog		O		S
Microhylidae				
Gastrophryne carolinensis Eastern narrow-mouthed toad	X S			
Ranidae				
Rana utricularia Southern leopard frog	X S			
REPTILIA TESTUDINES				
Chelydridae				
Chelydra serpentina Snapping turtle	X	X	X	X
Kinosternidae				
Kinosternon subrubrum subrubrum Eastern mud turtle	X S	X	X	X S
Emydidae				
Clemmys guttata Spotted turtle	S			
Malaclemys terrapin Diamondback terrapin	X S	X	X	X
Cheloniidae				
Caretta caretta Atlantic loggerhead	X	X	X	X
Dermochelyidae				
Dermochelys coriacea coriacea Atlantic leatherback		X S		

SPECIES AND COMMON NAME	Shackleford Banks	Core Banks South of Drum Inlet	Core Banks North of Drum Inlet	Portsmo Islan
SQUAMATA				
Iguanidae				
Anolis carolinensis carolinensis Green anole	X S			
Ieiidae				
Cnemidophorus sexlineatus sexlineatus Six-lined racerunner	X S	X S	X S	X S
Scincidae				
Eumeces inexpectatus Southeastern five-lined skink	X S			
Leiolopisma laterale Ground skink	S			
Anguidae				
Ophisaurus ventralis Eastern glass lizard	X S	X S	X	X S
Colubridae				
Natrix sipedon williamengelsi Carolina salt marsh snake	X S	X S		X S
Natrix fasciata fasciata Banded water snake	X S			
Storeria dekayi dekayi Northern brown snake		O		
Lampropeltis getulus sticticeps Outer Banks kingsnake		O S		X S
Coluber constrictor Black racer	X S	X S	X	X S
Thamnophis sauritus Ribbon snake	X S			
Elaphe obsoleta "parallela" Greenish rat snake	X S			
Heterodon platyrhinos Eastern hognose	S			
Rhadinaea flavilata Pine woods snake	X S			
Opheodrys aestivus Rough green snake	X S	O		S
Viperidae				
Sistrurus miliarius Carolina pygmy rattlesnake	X			
Agkistrodon piscivorus piscivorus Eastern cottonmouth	X			

BIRDS

Birds are the most numerous and visible of all the vertebrate groups found within the Seashore. This is due to several factors: location on the Atlantic Flyway, varied habitats, mobility, and strong winds and hurricanes which drive exhausted vagrants inshore and onto land. Although studies and comprehensive lists have been done on birds of the surrounding geographic area, literature citations are limited and little research has actually been conducted in relation to birds specifically found within Cape Lookout National Seashore. A Species List of Birds of Carteret County, North Carolina (Fussell & Quay) contains some records for the Seashore, but its emphasis is on a much broader geographic area which includes the Seashore. The most current research within the park is being conducted by Drs. Soots and Parnell under the Federal Sea Grant Program. This project involves censusing colonial nesting birds and their nests along the North Carolina coast. As a result of this gap in the availability of extensive baseline data, we have been relying heavily on park field personnel and local birders to provide field observation records. The majority of the sightings that follow were obtained from these field observations. The list is far from "complete", if we use Fussell's Carteret County and Cape Hatteras National Seashore's lists for comparison.

In addition to numbers of species occurring within the Seashore, other critical information, such as distribution, relative abundance, seasonal occurrence, and habitat needs still have not been determined.

There are no rare or endangered species known to nest within the park; however, the following endangered species do occur here:

Brown Pelican (Pelecanus occidentalis) - Appears to be a fall and winter resident on the Seashore. The northernmost known nesting colony on the east coast is located a few miles east of the Seashore boundary on Pamlico Sound.

Peregrine Falcon (Falco peregrinus) - The "tundra" race of this species is a fall migrant on the Outer Banks. Individuals were observed in the fall of 1976 and 1977.

There are thirteen other species for which there is only one record. Some of these individuals are probably accidentals (less than four records), but information is still lacking to make a definite determination as to status. They are as follows:

Magnificent Frigatebird
Mute Swan
Common Eider
Long-billed Curlew
Curlew Sandpiper
Red Phalarope
Glaucous Gull
Roseate Tern
Bridled Tern
Noddy Tern
White-winged Dove
Scarlet Tanager
Western Tanager

Those birds which will deserve special attention, from a management standpoint, are the colonial nesting birds. These species are:

Common Tern
Least Tern
Gull-billed Tern
Black Skimmer

The above species are most susceptible to the adverse effects of human disturbance and habitat manipulation. Other solitary nesting birds associated

near these colonies are the American Oystercatcher and Wilson's Plover. Dr. Robert F. Soots believes that the area near the Cape Lookout Lighthouse may be the major nesting site for the Wilson's Plover in North Carolina.

COMMON NAME	Spring	Summer	Fall	Winter
Common loon	X	O	O	O
Red-throated loon			O	
Horned grebe	O	O	O	O
Pied-billed grebe		O	O	O
Greater shearwater		O	O	
Brown pelican	O	O	O	O
Gannet		O	O	O
Double-crested cormorant			O	O
Magnificent frigatebird		O		
Great blue heron		O	O	O
Green heron		O		
Little blue heron	O	O		
Cattle egret		O	O	O
Great egret		O	O	O
Snowy egret		O		
Louisiana heron	O	O	O	O
Black-crowned night heron		O	O	O
Yellow-crowned night heron		O		
American bittern			O	O
Glossy ibis		O	O	
White ibis		O	O	
Mute swan				X
Whistling swan			O	O
Canada goose			O	O
Brant			O	O
Snow goose			O	O
Mallard			O	O
Black duck			O	
Gadwall			O	O
Pintail			O	O
Green-winged teal			O	O
Blue-winged teal			O	
American widgeon				O
Northern shoveler				O
Wood duck				O
Redhead			O	O
Greater scaup			O	O
Lesser scaup				O
Bufflehead			O	O
Oldsquaw	O			
Common eider		X		
White-winged scoter				O
Surf scoter			O	O
Black scoter			O	O
Ruddy duck				O
Hooded merganser				O
Red-breasted merganser			O	O

COMMON NAME	Spring	Summer	Fall	Winter
Turkey vulture		O	O	
Sharp-shinned hawk			O	O
Red-tailed hawk			O	
Red-shouldered hawk			O	
Marsh hawk		O	O	O
Osprey		O	O	
Peregrine falcon			O	O
Merlin			O	O
American kestrel			O	O
Bobwhite	O	O	O	O
Clapper rail		O	O	
Virginia rail				O
Black rail			O	
American oystercatcher	N	O	O	O
Semipalmated plover	O	O	O	O
Piping plover	N	O	O	O
Wilson's plover	N	O	O	
Killdeer		O	O	O
American golden plover			O	
Ruddy turnstone	O	O	O	O
American woodcock		O	O	
Common snipe			O	O
Long-billed curlew		X		
Whimbrel	O	O	O	
Upland sandpiper		O		
Spotted sandpiper		O	O	
Willet	O	O	O	O
Greater yellowlegs		O	O	O
Lesser yellowlegs		O		
Red knot	O	O		
Purple sandpiper				O
Pectoral sandpiper		O		
Least sandpiper		O	O	
Curlew sandpiper		X		
Dunlin	O		O	O
Short-billed dowitcher		O	O	
Long-billed dowitcher			O	
Semipalmated sandpiper		O	O	
Western sandpiper			O	O
Buff-breasted sandpiper		X	O	
Marbled godwit		X	O	
Sanderling	O	O	O	O
American avocet		O		
Black-necked stilt		O		
Wilson's phalarope		O		
Northern phalarope	X	X		
Red phalarope	X			

COMMON NAME	Spring	Summer	Fall	Winter
Pomarine jaeger	O			
Parasitic jaeger	O			
Long-tailed jaeger	O			
Glaucous gull	X			
Great black-backed gull		O	O	O
Herring gull	O	O	O	O
Ring-billed gull		O	O	O
Laughing gull	O	O	O	O
Bonaparte's gull			O	O
Black-legged kittiwake	X	O	X	
Gull-billed tern	N	O	O	O
Forester's tern		O	O	O
Common tern	N	O	O	O
Roseate tern		X		
Bridled tern	X			
Least tern	N	O	O	
Royal tern	O	O	O	O
Sandwich tern	O	O	O	
Caspian tern		O	O	
Black tern		O	O	
Noddy tern		X		
Black skimmer	N	O	O	
Dovekie				O
Mourning dove	N	O	O	O
White-winged dove			X	
Yellow-billed cuckoo		O	O	
Barn owl			O	O
Short-eared owl			O	
Chuck-will's widow		X		
Common nighthawk	N	O		
Chimney swift			O	
Ruby-throated hummingbird		O		
Belted kingfisher	O	O	O	O
Common flicker			O	O
Red-bellied woodpecker			O	
Yellow-bellied sapsucker			O	
Eastern kingbird	O	O	O	
Gray kingbird			O	
Great crested flycatcher		X		
Western kingbird			O	
Eastern phoebe			O	
Acadian flycatcher			O	
Eastern wood pewee	O			
Tree swallow			O	O
Rough-winged swallow			O	
Barn swallow	N	O	O	
Purple martin	N	O		

COMMON NAME	Spring	Summer	Fall	Winter
Common crow	O	O	O	O
Fish crow		O	O	O
Carolina chickadee		O	O	
Tufted titmouse		O		
Red-breasted nuthatch			O	
Brown creeper			O	
Carolina wren		O	O	
Long-billed marsh wren			O	
Short-billed marsh wren			O	O
Mockingbird	O	O	O	O
Gray catbird	O	O	O	O
Brown thrasher	O	O	O	O
American robin			O	O
Wood thrush			O	
Hermit thrush			O	
Cedar waxwing				O
Starling	O	O	O	O
White-eyed vireo	O	O		
Solitary vireo			O	
Warbling vireo			O	
Red-eyed vireo		X		
Philadelphia vireo			O	
Black-and-white warbler			O	
Prothonotary warbler		O		
Northern parula			O	
Yellow warbler		O		
Cape May warbler			O	
Black-throated blue warbler			O	
Magnolia warbler			O	
Yellow-rumped warbler			O	O
Black-throated green warbler			O	
Yellow-throated warbler	O	O		
Pine warbler	O	O	O	
Prairie warbler		O		
Palm warbler	O		O	O
Northern waterthrush		O		
Common yellowthroat	O	O	O	O
Yellow-breasted chat		O		
Hooded warbler	O		O	
American redstart		O	O	
Bobolink	O			
Eastern meadowlark	O	O	O	O
Red-winged blackbird	O	O	O	O
Orchard oriole	O			
Northern oriole	O			
Boat-tailed grackle	N	O	O	O
Common grackle	O	O		

COMMON NAME	Spring	Summer	Fall	Winter
Brown-headed cowbird			O	
Scarlet tanager	X			
Western tanager			O	
Cardinal	O	O	O	O
Rose-breasted grosbeak	O			
Blue grosbeak	O			
Indigo bunting	O	O		
Painted bunting		O		
Purple finch			O	
Pine siskin			O	O
American goldfinch				O
Savannah sparrow				O
Grasshopper sparrow			O	
Seaside sparrow		O		O
Clay-colored sparrow			O	
Dark-eyed junco			O	O
Chipping sparrow			O	
Field sparrow			O	
White-crowned sparrow			O	
White-throated sparrow	O		O	O
Fox sparrow			O	O
Swamp sparrow			O	O
Song sparrow			O	O
Snow bunting				O

MAMMALS

From July 2 through August 14, 1977, a five week program was conducted in the Seashore to make a preliminary survey of the mammals within existing boundaries and on adjacent Shackleford Banks. During this period, collections and observations were made predominantly at the following localities: 1. Shackleford Banks; major trap concentration covered the area from one-half mile west to two miles east of Mullet Pond (655 trap nights). 2. Core Banks south of Drum Inlet; at Guthrie's Hammock, one-half mile northeast and one-quarter mile southwest of Diamond Light, and in the area surrounding the Coast Guard Station (485 trap nights). 3. Portsmouth Island; around the town of Portsmouth and its fresh water marshes (199 trap nights).

Results of a collecting expedition, made in 1972, are included in this report. During the 1972 trip, about two months were spent primarily on Portsmouth Island and the Cape Lookout area on Core Banks. Most of the specimens acquired on this trip are housed at the University of Massachusetts Museum of Zoology at Amherst. Specimens taken in the 1977 study are at the Seashore Headquarters.

In the 1977 survey, specimen collection was limited to one or two representative skins and/or skeletons for each species from the major localities. Thus, the majority of the traps used were either Sherman, Havahart or Gee Wire Minnow live traps. At times; however, lines of snap traps were run using Museum Specials and Victor 4-Way rat traps.

Snap traps were effective only when it was possible to camp near the trap site and check them in the mornings and evenings. With just daily checking, most specimens would be too severely ant eaten to be of use.

Sherman Live Traps were productive except in areas with dense populations of raccoons. Gee Wire Minnow Traps proved to be more raccoon proof and are effective in that they catch more than one animal. One of their best features is that they can be amply baited then left for several days before rechecking. In trapping for larger mammals, like raccoons, Havahart traps are often disappointing. Raccons are notorious in their ability to hold up the doors of these traps with their rear ends after they have tripped them; they finish the bait, then back out.

While some trapping and collecting of mammals has been done on Shackleford, primarily by Dr. William Engels in 1939, relatively little is known about the fauna of the Core Banks - Portsmouth Island region. No specific references to any previous mammal studies on Core Banks or Portsmouth area have been found.

Contrasting Shackleford with these other islands is particularly interesting. As opposed to the Core Banks - Portsmouth Island system, portions of Shackleford Banks western end bear a comparatively stable woodland habitat. Here, it is sheltered from the sea by the extensive series of dune ridges stretching northward from the berm. This area can be characterized by several examples of the existing flora: American hornbeam (Carpinus carolina), Pignut hickory (Carya glabra) and Loblolly pine (pinus taeda) common on Shackleford but not native to the Core Banks - Portsmouth Island region.

The eastern portion of Shackleford is less vegetated, and like Core Banks, is subject to overwash during storms. This end of Shackleford seems to be the interface of the relatively high and protected western portion and the rigorous environment of the intra-capes ecological zone. This zone

extends northeastward from Cape Lookout to just southwest of the border of Buxton Woods at Frisco, Hatteras Island (Lazell and Musick, 1973). This change in ecology is vital to much of the terrestial vertebrate fauna on the Banks and the ranges of several species terminate at the edge of this zone.

At the southern limit of the intra-capes zone, the ecological change seems to be controlled by the islands orientation to the winds. Shackleford Banks lies almost perpendicular to the prevailing southwesterly summer winds. Gentle wave action coming almost directly on shore tends to build the beach, and through the years this has led to the formation of expansive rows of dune ridges behind the beach. These dunes are large and run in broken lines parallel to the shore. Overwash does occur all along the bank, but evidence suggests that this process is so slowed on the western end of the island by its twisting passage between dunes, that the overwash is only partial (Godfrey 1976). It is probably for this reason that the Shackleford woodlands have escaped frequent inundation by storms and thus, are able to harbor certain species that could not tolerate exposure to flooding.

In contrast, all 50 miles of the Core Banks - Portsmouth Island system lie approximately parallel to the prevailing winds. This means that there is much littoral, or long shore drift, but little dune building. The consequent low profile and narrow dune barrier of these islands leaves open pathways for overwashing during violent storms. Only the hardiest or best adapted species can live here.

It is uncertain, but likely, that Didelphis marsupialis, the Opossum, still occurs on Shackleford Banks. In 1939, William Engels took two immature specimens from there but no others have been recorded since that time. Unless

competetive pressure from the large raccoon population has overcome the 'possum, they are probably present. No specimens of Didelphis have been taken from Core Banks, although Wardy Murphy, caretaker of the Core Banks Gun Club, claims to have seen them in past years. None seem to be on Portsmouth Island, although they may have been present at one time.

Cryptotis parva, the Least shrew, probably bears the distinction of being the only native small mammal typically inhabiting the upland regions of the Outer Banks as well as the marsh edges. This small shrew appears to be ubiquitous on Core Banks and undoubtedly occurs on Shackleford as well, although no specimens have as yet been taken from that locality. One specimen was collected in Portsmouth Village in 1973 and in 1977, one was taken from Cape Lookout and another from Guthrie's Hammock.

Engels (1952) comments that certain Shackleford habitats seemed to be well suited for Blarina (the Shortail shrew). He reports; however, no specimens were taken during 262 trap-nights in these favorable localities. In 1973, a nest of immature shrews, presumed to be Blarina because of their large size relative to their age, was found under a board on the grasslands of Cape Lookout. One juvenile was collected at the time and attempts made to capture the mother were unsuccessful. In 1977, efforts to trap this species were unsuccessful and it is unclear whether Blarina is indeed established on the Seashore.

Shackleford has 14 species of reptiles and amphibians that have not been found elsewhere in the Seashore. It appears that the only native mammal that has a similar limitation is Scalopus aquaticus (the Eastern mole). The burrows of this animal are commonly seen in the sandy loam of the Shackleford hammocks. Apparently, Scalopus depend on these high protected

areas, for no evidence of this animal has been found on Core Banks or Portsmouth Island. Engels (1952) comments on their evident abundance, but notes that efforts to collect specimens were unsuccessful. This summer one specimen was captured in a pit trap. The pellage was rich bronze, reportedly characteristic of southeastern Scalopus (Burt and Grossenheider 1976). Unfortunately, the skin was unsalvageable, but some good photographs were taken of the animal before a skeleton was made.

Procyon lotor, the raccoon, may be becoming increasingly common on the Banks. Indeed, this may become a problem on Shackleford where they already seem overly abundant. Strangely enough, Engel (1952) does not list raccoons as being present on Shackleford Banks; either their numbers must have been extremely reduced when he visited, or they could have been introduced or colonized the island since that time. Several serious coon hunters could probably wipe out a raccoon population in short order, as there are few safe refuges on the islands. Conversely, raccoons are opportunistic and easily established in an area under favorable circumstances. Therefore, one can not be sure if all populations of raccoons on the Banks are native colonizers or whether there has been a history of extermination and recolonization by natural means and/or man's intervention. One specimen, skin and skull, was taken from Shackleford Banks and one skull only from Portsmouth Village. Two raccoons were captured on Core Banks by park staff at the Cape Lookout Bight and Guthrie's Hammock. Both were observed and released.

No serious effort was made to trap Lutra canadensis, the River otter. However, one of the park staff reportedly sighted two otters in Back Sound off of Shackleford on January 5, 1977. This species is known to have large

home ranges and it is likely that the same pair could range over a significant part of the Seashore.

The park has a problem with house cats, *Felis cattus*. These feral animals do distressingly well on the Banks at the expense of much of the native wildlife. Engels (1952), notes their presence on Shackleford and there are presently large populations clustering about the fish camps on Core Banks. Apparently, Portsmouth Island has less of a problem; presumably these animals do not get as much human support as do the "garbage dump" cats further south. Typically, these dump cats inhabit the junked cars on the periphery of the fish camps. Since plans for removal of these wrecks are underway, we can look forward to a good portion of our cat problems leaving with the cars. Once this clean-up is accomplished, removal of the surviving cats will be much more easily dealt with. One voucher specimen, a skull, was collected at Cape Lookout, Core Banks.

Although it seems that the Outer Banks should be able to support several species of southeastern rodents, it appears that the only native resident is *Oryzomys palustris*, the rice rat. These animals live in great numbers in the salt marshes on the sound side of Core Banks. Rice rats seem to prefer the area extending from the lines of washed up detritus in the *Juncus roemerianus* (black needle rush) zone to the shrubby border of these marshes where *Myrica cerifera*, (wax-myrtle), *Baccharis halimifolia* (silverling) and *Iva frutescens* (marsh elder) are the dominant vegetation. However, on Shackleford Banks and Portsmouth Island, they also commonly inhabit the fresh-water *Typha* (cattail) marshes.

This summer one *Oryzomys* was trapped on Shackleford Banks, twelve on Core Banks (two at Cape Lookout and ten, one-half mile northeast of Cape

Lookout Light), and twenty five on Portsmouth Island where they seemed most abundant. In February 1977, one specimen was taken just north of the Core Banks Gun Club by park staff.

Apparently, the only other small rodents on the Seashore are the introduced old-world genera _Rattus_ and _Mus_. Both do overly well on the Banks, especially around areas of human habitation. However, _Rattus_ and _Mus_ also survive in the wilder regions. For instance, on Shackleford Banks there is little human subsidization for these animals, yet _Mus_ and _Rattus_ are both apparently present.

Mus musculus, the house mouse, was collected on Shackleford Banks by William Engels in 1939, who notes (Engels 1952) that his total catch was less on Shackleford than it was under similar conditions on Ocracoke Island. This summer no _Mus_ were taken from Shackleford, although two nests presumably belonging to this species were seen under boards near the beach. Traps were set in habitats similar to those in which many specimens had been taken on Core Banks and Portsmouth Island. These combined results suggest that this species has a more difficult time surviving in wilder areas. As Core Banks is restored to a more natural condition, we may begin to see fewer of these mice. The 1977 survey turned up seven _Mus_ from Core Banks; two from Cape Lookout, three from the grassland one-fourth mile south of Cape Lookout Light, and one from the marsh border one-half mile northeast of Cape Lookout Light. On Portsmouth, twenty four were trapped in and around the village. One _Mus_ was collected in February by park staff near Guthrie's Hammock, Core Banks.

Rattus probably occurs throughout the Seashore as well. One specimen, _Rattus norvegicus_, the Norway rat, was captured in Portsmouth Village. It

is not yet known whether this is the only species of Rattus on these islands. On Ocracoke, Rattus rattus is the dominant species, living inside the buildings and the closely associated habitat (Quay 1959). Although the habitat on Cape Lookout National Seashore seems less appropriate for R. rattus, they may have invaded this area as well.

Engels (1952) does not mention Rattus of either species as present on Shackleford Banks. Similarly none were secured during this summer's survey, but on two occasions identifiable tracks were seen in the dunes on this island.

Myocastor coypus, the Nutria, coypu, or Russian-rat, as they are locally called, is a South American introduction. It was originally brought to the southern United States as a commercial fur animal, but it is told that soon tradesman tired of trying to make their scant wiry pellage look like coats, and released the animals. They have since colonized a good part of the south, and being quite aquatic, had no trouble making it to the Outer Banks. No specimens were taken, but one Myocastor was seen dead on Core Banks by Park Rangers in front of the Core Banks Gun Club on December 17, 1976. On Portsmouth, a system of runways, mudslides into creeks and freshwater ponds and large holes in banks, indicate that the coypu occurs on this island as well.

Rabbits should be all over. Two species occur within the Park; Sylvilagus floridanus, the eastern cottontail, and Sylvilagus palustris, the Marsh rabbit. As yet, S. palustris has only been recorded on Shackleford Banks (Engels 1952). This summer S. floridanus was seen and observed to be quite common on both Shackleford and on Portsmouth Island. No rabbits were seen

on Core Banks south of Drum Inlet. Wardy Murphy (Core Banks Gun Club) commented that rabbits used to be common on Core Banks but that he had seen few in recent years. The explosion in the feral cat population may well be causing the disappearance of the Core Banks rabbits. Rabbit nest raiding is likely a relatively productive activity for the cats, and it is easy to visualize this occurring. It should be noted that this raiding is probably not limited to mammalian nests; the tern colonies are also particularly vulnerable.

Portsmouth Island has a peculiar population of cottontails. Their pellage is a rich orangey brown. In 1973, a specimen, skin and skull, with this color characteristic was collected in Portsmouth. During the several weeks spent on the island, no other rabbits were seen. This summer five more of these cottontails were observed; all had the same bright coat color as the first Portsmouth specimen. It is possible that this rabbit is different enough to merit racial distinction; further research concerning this problem is in process.

There are a few species of mammals not mentioned in the checklist that may be present in the park. One of these is Mustela vison, the mink. This species should be present, as several area residents have told of trapping large numbers off these banks in past years.

Wardy Murphy claims to have trapped a red fox, Vulpes fulva several years ago. It is most likely that this animal would represent an introduction as one would not expect this area to be within the natural range of the red fox. Originally, there may have been native grey foxes (Urocyon cinereoargenteus) on the islands.

The apparent absence of bats is surprising. Engels (1952) reports they are not present on Shackleford and this summer with two evenings of intensive observation on Shackleford and four evenings of observation on Portsmouth, none were noted. They may not be there, but this would be hard to believe.

Several other conspicuous mammals, not included on the checklist, are the horses, sheep, goat, cattle and domestic rabbits on Shackleford Banks. Presumably, the large ungulates belong to people and will be only removed when Shackleford is incorporated into the Seashore. The domestic rabbits have not been long-term residents and it should be relatively easy to remove them from the island.

SPECIES AND COMMON NAME	Shackleford Banks	Core Banks South of Drum Inlet	Core Banks North of Drum Inlet	Portsmo Islan
MARSUPIALIA				
Didelphiidae				
Didelphis marsupialis Opossum	X			
INSECTIVORA				
Soricidae				
Cryptotis parva Least shrew		S		S
Blarina brevicauda Shorttail shrew		S		
Talpidae				
Scalopus aquaticus Eastern mole	X			
CARNIVORA				
Procyonidae				
Procyon lotor Raccoon	S	O		S
Mustelidae				
Lutra canadensis River otter	O			
Felidae				
Felis cattus House cat	X	S		O
RODENTIA				
Cricetidae				
Oryzomys palustris Rice rat	X S	S		S
Muridae				
Mus musculus House mouse	X S	S		S
Rattus norvegicus Norway rat				S
Capromyidae				
Myocastor coypus Nutria		O		

SPECIES AND COMMON NAME	Shackleford Banks	Core Banks South of Drum Inlet	Core Banks North of Drum Inlet	Portsmo Isla
LAGOMORPHA				
Leporidae				
Sylvilagus floridanus Eastern cottontail	O			S
Sylvilagus palustris Marsh rabbit	X			

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